REMARKS

This paper is responsive to the Office Action dated September 30, 2004. Claims 1 - 10 are pending in this application. Claims 1, 2, 4, 5 and 7 - 10 are rejected. Claims 3 and 6 have been objected to as being dependent from rejected claims. Reexamination is respectfully requested in light of the following remarks.

In Applicant's claim 1, Applicant at line 3 claims an aspheric surface that a luminous flux having a wavelength λ_1 is converged at a first predetermined position. This condition of the claim is shown in Applicant's Figure 3B. The description of Figure 3B is found in Applicant's specification at paragraph [0041] where it is explained that in the case of λ_1, the laser beam (2) (λ_1) is favorably focused onto a recording surface (36A) of the DVD (36) due to the convex form of the diffraction type optical pickup lens (8) and the aspheric forms formed on both surfaces (8a) and (8b) of the lens (8). In this description, there is no mention of any of effect of diffraction on the formation of the image shown in Figure 3B. This is confirmed at paragraph [0042] where it is explained that the zone plate (12) formed on the first surface (8a) has no focusing action with respect to the laser light (2) having a wavelength λ_1. It is explained that this laser light (2) (λ_1) is refracted in conformity to the original form of lens (8).

At lines 4 - 6 it is explained in the claim that λ_2 is converged at a second predetermined position. This is explained at

paragraphs [0040] - [0042]. Light having a wavelength λ_2 when focused by the diffraction type optical lens (8) onto the recording surface (26A) (Figure 3A) also has aberrations corrected by the zone plate (12) formed on the surface (8a) of the diffraction type optical pickup lens (8) on the source side (see paragraph [0040]).

In Applicant's invention, the phrase "wave-length selectivity" is used in the meaning that the zone plate functions on only one wavelength of two different wavelengths used therewith. In the reference '322, the diffraction occurs in both of the two wavelengths. That is, in both of the two wavelengths, the light is diffracted sideways respectively.

In claim 1, lines 6 and 7, it is stated "whereas said luminous flux having said wavelength λ_1 is transmitted therethrough as it is". This is the condition shown in Figure 3B as explained above, and as set forth at paragraph [0042] where it is stated that 100% of the zero-order diffraction light with respect to laser light (2) at λ_1 is refracted in conformity to the original form of lens (8).

In the outstanding Office Action, the Examiner has not explained how one of the wavelengths in the Broome '322 reference is transmitted therethrough as it is. Applicant respectfully traverses the rejection on the grounds that Broome in fact has a diffractive action on both of the wavelengths at 650 nanometers at 780 nanometers. The Examiner has relied upon Figures 5 and 8 as showing convergence, but has not shown that there is no diffractive action (passing through as it is) on either one of the two frequencies.

As it is explained in Applicant's specification and is shown in Figures 3A and 3B, the purpose of the design where one frequency is transmitted therethrough as it is, is to produce two different spots at two different depths. This feature is not found in Broome '322. Instead, Broome teaches that the depth of diffractive surface of the invention is therefore chosen midway between two wavelengths at a value of 715 nanometers. This is to compensate for the fact that there are two different depths. However, the problem as explained with respect to Figure 11 and in column 7, lines 10 - 22, is that both frequencies undergo the diffractive effect. Stated another way, column 7, lines 15 - 20 teaches that not all of the energy of the two wavelengths can be directed into their respective first order images. On the other hand, as taught by Applicant, there is 100% zero-order diffraction light from zone plate (12) in the case of Figure 3B as taught by paragraph [0042].

'322 also teaches away from Applicant's invention at column 5, lines 49 - 53. Here is states that the objective has a slightly different back focal distance for the two wavelengths of interest, but that this is unimportant because an autofocus mechanism brings the objective to its best focus. In contrast, Applicant's device provides the focus by diffractive control on λ_2 (Figure 3A) and no diffractive effect (transmitted therethrough as claimed) as shown in Figure 3B.

Next, '322 teaches at column 4, beginning at line 27 and continuing through line 34, that there is an amount of spherical aberration for the two systems. Spherical aberration does not

occur in Applicant's case of Figure 3B and λ_1 because, as stated in the claim, it is transmitted therethrough as it is.

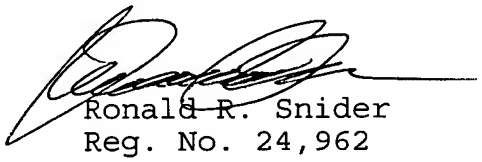
Finally, the last sentence of the Abstract states that the diffractive effects provide correction of spherical aberration and spherochroism that the single element objective lens achieves diffraction-limited image quality for both CD and DVD formats. This simply teaches against Applicant's claim which states that one of the wavelengths (λ_1) is transmitted therethrough as it is.

Claim 2

In the reference '322, a concentric grating has a saw-tooth cross section. On the other hand, in our invention, a concentric grating has a stepped cross section. In case of saw-tooth diffraction grating, the light is diffracted in sideways in both of the two wavelengths as explained above. It means a loss of light quantity. One the contrary, in case of stepped diffraction grating as the invention, it is possible to make the diffraction occur in sideways with respect to only one of the two different wavelengths by setting up any predetermined condition. It means suppressing the loss of light quantity. In addition, since the diffraction grating of the invention functions on only one of the two different wavelengths, it makes possible to design the diffraction grating taking into consideration the only one wavelength which will be influenced by diffraction.

In view of the foregoing, it is respectfully submitted that the application is now in condition for allowance, and early action in accordance thereof is requested. In the event there is any reason why the application cannot be allowed in this current condition, it is respectfully requested that the Examiner contact the undersigned at the number listed below to resolve any problems by Interview or Examiner's Amendment.

Respectfully submitted,



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